

momentum

HOW HARD something
is to stop.

velocity

MASS

"P"

is A vector

has the same direction
as the velocity

A Pitcher throws the BALL
AT $45 \text{ m/s}^{\text{EAST}}$. The ball has a mass
of 0.75 kg . What is the momentum
of the ball?

① Data

$$v = 45 \text{ m/s E}$$

$$m = 0.75 \text{ kg}$$

$$p = ?$$

EQUATION

$$\textcircled{2} p = mv$$

③ SUBSTITUTION

$$p = (0.75 \text{ kg})(45 \text{ m/s E})$$

④

⑤

$$p = 33.75 \text{ kg} \cdot \text{m/s E}$$

The batter hits the BALL
The ball's new velocity is
57 m/s West. What is the
ball's momentum Now?

$$v = 57 \text{ m/s W}$$

$$m = .75 \text{ kg}$$

$$p = ?$$

$$p = mv$$

$$p = (.75 \text{ kg})(57 \text{ m/s}) \text{ W}$$

$$\boxed{p = 42.75 \text{ kg} \cdot \text{m/s W}}$$